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Knowledge Management using Intranets and Enterprise Portals

Parallel session invited paper

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Abstract: Modern companies migrate to responsive e-business models, by investing in ***information and knowledge-driven applications***, that help them respond rapidly to changing market conditions and customer needs, under the impact of globalizations and the new information and communication technologies. The knowledge and data/information harvesting is mainly customer-centric, personalization, and customization, which implies having the means to tailor the content, format, and medium of key decision-support information and knowledge to the needs of individual users. This trend is based on the use of technologies that enable the delivery of personalized information and knowledge to large number of end-users through a variety of channels, mainly internet/extranet/intranet oriented.
Many organizations have developed intranets and have understood the potential that this technology has in supporting the aims of knowledge management. In the paper is described a new vision for a ***knowledge-enabled intranet***, and is outlined how this can be achieved by using the concept of developing knowledge content artefacts. Also is presented a better way to address employees personal and job needs, by delivering more self-service capabilities and personalisation, developing ***enterprise portals***.
Keywords: intranet, knowledge-enabled intranet, knowledge management, enterprise portals, enterprise taxonomy.

1 Introduction

Traditional applications in the enterprises, mainly related to **ERP** (Enterprise Resource Planning) and **CRM** (Customer Relationship Management), are using massive amount of data on operation and customers, that are unused in datawarehouses. To turn that stored data into valuable information, companies are now questing knowledge applications (**KApps**). The business advantage in having Kapps, lies in the ability to analyze large amounts of data from any business model, determine the personalized preferences of all potentially customers, than rich them with relevant information, wherever they may be. These serves as the driving force for new generation of applications. Traditionaly, we have query-and-response paradigm for applications. For the new generation of applications, the logic is reversed: *what-if-system* didn't wait for the end user to have the question, and the system just asked the question for the end-users and send them the answer. In this way one could anticipate a whole set of questions. This new class of applications allows companies not only to collect but to analyze data and information, in order to devlope better supplier and customer relationships. It is aimed at increasing profitability through revenue grouth. This revenue-enhancing framework, focuses on an interesting mix of modeling, data processing as decision support, information retrieval, reporting and analysis, what-if-scenarios, datawarehouses, and data mining. Knowledge-driven applications have the potential to expand the use of information, by transforming existing huge data collections into revenue-generating asset [2].

2 Emerging classes of KApps

To take the full advantages for knowledge and information-based business models, there is a need for an integration framework that can tie together the various classes of Kapps. Some of the emerging classes of Kapps are [10]:

- **Customer Relationship KApps**: offer companies tools for mining customer data and information, having as outcome of this data mining process improved pricing, greater market share, longer customer retention, or a new revenue flow. For this, the companies must to do more real-time relationship management, the trend known *as personalization* (better understand and respond to each customer's needs, behavior and intentions, ensuring that customers get exactly what they need-when they need it).

- **Supply Chain KApps**: encourage trading partners to improve profits by managing inventories in the supply chain, by obtaining the information that enables visibility and certainty, offering more favorable terms, increased levels of supplies, invest in co-marketing.

- **Knowledge / Innovation Management**: assure the companies to push technologies farther, giving their employees instant access to informations and reports that previously took days or week to obtain.

- **Remote Performance Monitoring**: provide information to operating managers throughout an enterprise, that enables them to improve performance on an routine basis, by bridging operations and strategy, using key performance indicators.

- **Simulation by using *what-if scenario analysis***: encompasses advanced simulation and scenario modeling, based on information from diverse internal and external sources. This enable management to participate in developing strategies and learn risk management(by modeling of future risk and returns).

3 Architectural framework for KApps

To create an integrated decision framework, the organizations have to implement a number of KApps builted on a platform that is composed of three layers [6]:

1. **e-Business decision-support solutions**, that includes the ability to deliver views and queuing, reporting, and modeling capabilities that go beyond current offerings.

2. **Enabling technologies**: data mining, query processing, and result distribution infrastructure, that means the ability to store data in a multidimensional cube format (On-Line Analytical Processing - **OLAP**), to enable rapid data aggregation and profound analysis.

3. **Core technologies**, as data warehousing, and data markets, that get all company data working together so that user can see more, learn more, and make the organization to work better.

Because information access and control drive business competition, it is obvious to consider the lack of boundaries in modern business and that fact that corporations and consumers are becoming more interconnected via private networks and Internet. These increasing interconnections are facilitating development of KApps in three phases:

1. **Corporate Intranets**, in which the companies are creating complete and uniform linkage of information and knowledge resources distributed through the organization. For the knowledge creation to occur, data aggregation needs to be complemented with data analysis. Moving from departmental solution, in which data and reports are developed for small, specialized communities of users, to a corporate intranets, opens up data resources to a broader base of users, by using the browser as a standard interface.

2. **Extranets**, that are focusing on supply chain partners, in the conditions when the companies are moving parts of the internal corporate information infrastructure, so that suppliers and trading partners can access them(through fire-walls). The key business drivers are : fast access, customized data, and responsivennes. Standardized reports and interfaces are minimizing services requirements imposed by the management of huge data volumes, cross-platform coverage and support, response time speed, and a broad range of interface choices.

3. **Commercial Internet Applications** that focuses on new business models, created for capturing, consolidating, and reselling consumer informations, business transaction records, and financial data.

At the present, most companies and corporate strategy are in phase I, with the emphasis on creating the ability to imitate decision making through all levels of an organization. But they are facing the challenges of performing complex computational analysis on collected data and of disseminating the information and knowledge not only to employees, but also to customers, suppliers, and business partners.

4 The knowledge-enabled intranet

Most major organisations today have an intranet or several intranets, and this technology is delivering significant business benefits [1, 2, 3, 4, 7, 8, 9]. The big issue now is how to turn the intranet into the tool that it has as potential to do with knowledge-enablement than technology. The quality varies greatly from the content as limited amount of static information only, to carry a wider range of more focused information, and to be used by a growing audience.

At the first stage, the corporate intranet, as a network of the existing local intranets the questions raised refer about what information should be available, bringing that information in some defined standards for content (ex. web page for every department). The most advanced intranets usually also provide some level of paperless administration functionality (on-line services as personal records updating, expenses submissions, stationary ordering etc), saving money in internal costs. However beneficial they may be, the most advanced intranets are essentially becoming administrative tools rather than strategic business initiatives, by a full role in supporting the creation, sharing and application of the knowledge that is the core, value-creating competence of the organization. This is the meaning of the intranets to becoming knowledge-enabled. So, we can define the ***knowledge-enabled intranet (KEI)*** as an intranet that helps the organization to develop and profit from its unique knowledge assets, and supports the needs of staff in their roles as knowledge workers.

The fully **KEI**s goes further than providing read-only access to static information or paperless administrative functionality, in fulfilling corporate strategy, in supporting business processes and knowledge workers, and in developing the organization's intellectual capital, by providing a lot of facilities [6, 8, 9]:

- Focus for creation, capture, sharing, application and exploitation of the organization's differential knowledge, experience and learning.
- Support and promote efficiency, effectiveness and competitive edge through close integration with the core, knowledge-based processes and activities of organization.
- Help the people to find easily the help they need, and other people applications or documents, internal or external of the organization.
- Help people to communicate and collaborate, real-time, on-line or off-line, any time, anyplace, and anywhere.
- Automate intelligent, decision-making tasks and workflows.

From this requirements and facilities, all **KEI** need to succeed on three directions:

- be technically good and well-delivered (working in technical sense) ;
- be relevant and usable by the intended audiences and closely aligned to business processes (working in operational sense) ;
- focus on the knowledge sensitive areas (working in the business sense, supporting business strategy).

The intranet cannot become a successful knowledge management tool by adopting and upgrading sophisticated technology if is not adopted a broad approach of issues from all viewpoint: business, users, processes and content, and as well as technology. Usualy we can adopt some *key areas* to have knowledge-enabled intranet [8]:

- *Business integration*, to ensure that **KEI** address the real business priorities of the organization, supporting core competencies and strategy.
- *Process integration*, to provide optimum support at the operational level, assuring a close integration between people, tasks, workflow and content, enabling a knowledge-directed approach for use, learn, and share within each task to be mapped and analysed (ex. : a knowledge-enabled call centre).
- *Cultural alignment*, by re-organization, re-design of the jobs, by training and changes to recognition and rewards.
- *Content management*, by assuring content quality as a major issue, implementing basic processes for content sourcing, aggregation, training, sorting, editing, publishing and control.
- *New technology*, that can play a valuable role in enhancing the support the support that the intranet can provide: workflow and document management, portals, use profiling and intelligent agents.

5 Knowledge content artefacts

As presented above, a major issue and one vital way in which to knowledge-enabled an intranet, is to increase its knowledge content, qualitatively different to the kinds of content usually carried by either the static information or the paperless administration intranet. The following knowledge content artefacts might form a valuable part for the **KEI**:

- *Frequently-asked questions*, together with the answers.
- *Lessons learned* from the experience (distilled hits and tips).
- *Best practices and most efficient methods*.
- *Key contacts*, who to contact in specific situations.
- *Reminders*, as top-level warnings or suggestions.
- *Competitive analysis*, as distillation on their relative strengths and weaknesses.
- *Internal process models*, illustrating how various operating run.
- *Corporate history*, as past events and what have learned from it.
- *Instructions and procedures* needed in different occasions ("how to..")
- *Problems and solutions*, pooling the collective experience of dealing with specific difficulties.
- *Knowledge execution system*, as software applications that embody the models and instructions (programmes) to advice or guide a user.

These content artefacts differ from the content types more usually found on intranets (news, charts, documents etc), and what they have in common is that:

- they are the distilled results of some analysis, aggregation or judgement made about a group of information or a number of specific experiences or ideas;
- to function properly they need to maintain their contact with experience and analysis so that feedback from usage and new ideas can be incorporated on an ongoing basis.

This means that they are liked to the learning process of applying the knowledge in every domain, reviewing outcomes and new experience, and updating the artefacts. Such kind of artefacts can become a uniquely differential source of advice, guidance and insight that can inform and improve strategic decision-making as well as current operations.

6 Intranets and enterprise portals

Usually, employees easily accept and adopt intranets as a way of doing business. The next step is to find a better way to address employees' personal and job needs by delivering more self-service capabilities and personalisation [4, 6, 7]. For that the enterprise must have search capability as cornerstone in helping employees find available intranet-based content. The search capability had to be matched with appropriate corporate taxonomy and metadata to allow employees to browse for quality content. Enterprise taxonomies are used to describe the content that is generated by a business, and they are designed by looking at content and talking to subject matter experts so that an appropriate model of the data can be created.

Enterprise taxonomy is a multi-purpose, hierarchical list of terms that describes content, centrally managed or distributed with strong control model, that provides following benefits:

- can describe content across applications;
- are focus-agnostic (they have no explicit point of view);
- can be used to control the values in metadata;

- can extend search queries by adding synonyms, acronyms, and abbreviations, assisting site navigation.

Enterprise taxonomies are also being used to enhance corporate search, by using new search techniques, like semantic and actionable search, that are greatly improved by adding knowledge that is already built into an enterprise taxonomy structure.

A solution to enterprise/corporate intranet problems(chaos) is established to be ***enterprise portal*(EP)**, that provide a personalized window into enterprise for individual users or classes of users, based on job functions, roles, or other criteria. **EP** offers "one-stop-shopping" for knowledge workers, because is both a gateway to and a destination on the enterprise network that provides transparent, tailored access to distributed digital resources. In this way, **EP** improves efficiency and empowers employees to complete their jobs faster, better, and more effectively, increasing revenue and reducing operating costs.

Based on web-browser interface in the 4-tier web development/integration using an application and datawarehouse servers, enterprise portals can provide numerous benefits [4, 5]:

- interact with relevant information, knowledge or content and applications, both internal (via intranet) and external (via extranet, internet) to the company ;
- define business processes, including workflow-enabled processes that information automatically among various components ;
- collaborate with others (customers, suppliers, partners), both inside and outside the organization through self-service publishing ;
- provide access to business-intelligence functions, for key business events or parameters, for persons that must be alerted or notified.

Software product on the market (Oracle, Microsoft, **IBM** etc) incorporate several key feature necessary for providing a platform for enterprise-portal deployments:

1. Integration of enterprise information and application through an open interface, the portlet framework, that can be registered, and after they are available to users who have the correct access rights.
2. Incorporation of value-added core portal services, such as workflow, search capability, security, single sign-on, and an application-development environment.
3. Extensive customization and personalization capabilities at the enterprise, workgroup, and individual-user levels.

This kind of software provide a portal frame work for registration and integration of intranet-based applications and data/information stores, a set of feature-rich portal services, development tools, and a user interface that allows users to personalize their portal experiences. Some vendors are presenting knowledge management, business-intelligence, document management, or collaboration tools, as enterprise-portal products. However, these are specialized solutions that cannot meet the breadth and depth of companies' needs, especially those moving to an e-business model.

7 Intranet use for knowledge management

The enterprise portal drives integration with other applications, delivering not just the ability to find information, but to use tools to conduct the business, and allow information to be placed into applications and documents. Some examples for manufacturing companies are clarifying the role of enterprise portals and intranets for knowledge management:

- ***The Enterprise Knowledge Base*** (EKB) is an area where anyone can add to the repository, because the mission of EKB is to provide management and protection of company's informational assets, while capturing knowledge and providing large accessibility. The validity of the content and update are the responsibility of the submitter. Uers can come in and search by keyword or against taxonomies and meta-data that is a requirement for submission and approval. Frequent users may establish search profiles for re-use when visiting EKB.

- ***Knowledge Base Engineering*** (KBE) guides the design and manufacturer engineers who exclusively use CAD/CAM for their jobs. Depending on the component as system being designed/manufactured, the CAD/-CAM system contains rules, data, and dimensions that are the result of proven design or manufacturers processes. If the engineer attempt to violate a rule, for ex., the system makes suggestions based on proven knowledge and rules, allowing a rule to be violated only for innovations by flaggeding that new rules, that must have executive approval (sign-off).

- ***Best Practice Replication*** (BPR) is considered a supporting tool and process that is used primarily by members of specific communities of practice. The BPR system prompts the members (called 'focal points') via e-mail notification whenever are new best practices to review or when some time limits for responses have been expired. BPR applications can be accessed from the portal search engine specific keywords. Typically, the focal points are a conduit of knowledge, and they are responsible initially reviewing the knowledge as presented, then collaborating with their colleagues to determine if the practice is replicable at their location. The focal point then re-access the system, providing the feedback status for their location that can be :

  - **A** : adopt or adapt the practice or portions of it;
  - **NA** : not applicable practice;
  - **NEF** : not economically feasible, and the return is not worth the investment;
  - **P** : previously implemented;
  - **C** : previously adopted and now has been completed;
  - **INV** : under investigation while collaborating ($<$ 60 days).

The feedback form is designed to support project management (cost, timing, responsibilities).

8 Conclusions

The paper presented the concept of knowledge applications. and key area to address in or to have knowledge-enable intranet: business integration, process integration, cultural alignment, content management and new technologies. Also is considered the knowledge content artefact that might form a valuable part of knowledge-enable intranet , and a uniquely differential source of advice, guidance and insight that can inform and improve strategic decision-making as well as current operations.

After intranets adoption, the enterprise must have search capabilities to help employees and others to find available intranet-based content, by using enterprise portals. Enterprise portals can improve efficiency and empowers users as "focal points" to complete their jobs faster, better, and move effectively by implementing a platform for enterprise portals deployments as part of knowledge-enabled intranet.

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